

## REMARKS

Reconsideration of presently solicited supported catalyst suited for use as a cathode of a direct methanol fuel cell Claims 4, 13, 15, 22 and 23, and presently solicited direct methanol fuel cell Claims 16, 17, 24, 25 and 28 respectfully is requested. Each presently solicited claim is urged to define novel fuel cell technology that is neither disclosed nor fairly suggested in the prior art.

The present invention provides a novel direct methanol fuel cell and a specifically defined supported catalyst suitable for use in such fuel cell. As summarized at Page 2 of Applicants' Specification, various electrochemical reactions are facilitated in such fuel cells. More specifically, methanol and water react with each other to produce carbon dioxide, six hydrogen ions, and six electrons. The generated hydrogen ions travel through a hydrogen ion conducting electrolyte membrane which is positioned between the anode and the cathode to the cathode. At the cathode the hydrogen ions, electrons from an external circuit, and oxygen are caused to react to produce water. The overall reaction in such fuel cell produces carbon dioxide by the reaction of methanol and oxygen. Through these reactions a large proportion of energy corresponding to the heat of combustion of methanol is effectively converted to electrical energy.

In a sincere effort to expedite prosecution the specifically defined supported catalyst claims and fuel cell claims have been amended to delete reference to a palladium alloy. Claim 19 now appears in independent form as new Claim 28 and includes all of the limitations of presently solicited direct methanol fuel cell Claim 16. It respectfully is urged that the continued rejection of presently solicited Claims 4, 13, 17 and 22 to 25 under 35 U.S.C. § 102(e) over the different teachings of U.S. Patent 6,603,038 to Hagemeyer et al. would be lacking sound technical and legal bases. Hagemeyer et al. provides catalysts that differ from those of the presently solicited Claims and are designed for use during the gas-phase oxidation of ethylene and acetic acid to produce vinyl acetate. Hagemeyer et al. does not disclose or fairly suggest the presence of the electroconductive porous carrier of independent Claims 4 and 28. No alloy of Applicants' presently solicited Claims is contemplated for utilization even in the different context of the Hagemeyer et al. teachings. As discussed at Col. 7 of Hagemeyer et al. the use of palladium is emphasized.

As presently amended, Applicants' presently solicited Claims delete reference to the use of a palladium alloy in the different context of the present invention. Also, as already acknowledged in the Official Action the catalysts of Hagemeyer et al. are provided on different supports than as specified in Applicants' Claims 13,19 and 28.

Additionally, Hagemeyer et al. lacks a teaching or suggestion of a direct methanol fuel cell comprising a cathode, anode, and electrolytic membrane as presently claimed. No anticipation of Applicants' specifically claimed subject matter is found in the different teachings of Hagemeyer et al. The withdrawal of the rejection is urged to be in order and respectfully is requested.

Likewise, the continued rejection of presently solicited Claim 15 which further specifies the nature of the catalyst support under 35 U.S.C. § 103(a) over the different teachings of Hagemeyer et al. combined with those of U.S. Patent No. 6,573,214 to Abdo et al. would be inappropriate. Basic deficiencies of the primary reference are previously identified and discussed. Abdo et al. is concerned with a different catalyst to achieve preferential oxidation of carbon monoxide. It readily is acknowledged that Abdo et al. at Col. 5 (bottom) and Col. 6 (top) lists many many possible carrier materials including "activated carbon", etc. However, this reference to "activated carbon" in a different context falls far short of suggesting Applicants' overall specifically claimed contribution. Additionally, reference to "activated carbon" has been deleted from Applicants' presently solicited Claims 15 and 28. Even if the teachings of Hagemeyer et al. and Abdo et al. were thoughtfully considered by one of ordinary skill in the art, Applicants' specifically claimed subject matter still would not be fairly suggested. The prior art taken singly or in combination fails to anticipate or fairly suggest the limitations of the claims in such a manner that the rejection would be proper. It is basic to the examination process that in order to establish prima facie obviousness of a claimed invention, all of the claim limitations must be taught or suggested in the prior art. See M.P.E.P. § 2143.03 in this regard. To establish *prima facie* obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. See *In re Royka*, 490 F. 2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art". *In re Wilson*, 424 F. 2d 1342, 165 USPQ 494 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim that depends therefrom is nonobvious.

Finally, the continued rejection of presently solicited Claims 4, 13, 16, 17, and 22 to 25 under 35 U.S.C. § 102(b) over the inadequate teachings of U.S. Patent Application Publication No. 2001/0024634 to Bertsch-Frank et al. would be lacking a sound justification. Claims 15 and 19 were not subject to this rejection, and former Claim 19 now appears in independent form as new Claim 28. It must be recognized that Bertsch-Frank et al. is directed exclusively to a direct synthesis method for forming hydrogen peroxide by the reaction of hydrogen and oxygen. Bertsch-Frank et al. fails to reasonably teach a supported catalyst suitable for use as a cathode of a direct methanol fuel cell as presently claimed or a direct methanol fuel cell comprising a cathode, anode and electrolytic membrane as presently claimed. In all instances, Bertsch-Frank et al. requires a noble-metal compound and an inorganic iodine compound. In all instances, a different chemical reaction is carried out while using different equipment.

Contrary to Paragraph No. 6 of the Official action, it is not seen where Bertsch-Frank et al. reasonably could be found to contemplate a catalyst that would meet the limitations of presently solicited independent Claim 4. Such a teaching is absent in Paragraph No. [0016] which was cited by the Examiner and which reads as follows:

[0016] The catalyst generally is present in the form of catalytic particles (=carrier free) that can also be bound to a customary carrier. The catalytically active component contains one or several noble metals in pure form or in the form of alloys. Preferred noble metals are the platinum metals, especially palladium and platinum, as well as gold and silver. It is especially preferred that the catalytic particles contain at least 80% by weight palladium, 0 to 15% platinum and 0 to 5% by weight gold and/or 0-15% platinum and 0 to 5% by weight silver in alloyed or non-alloyed form as well as an iodide of one or several elements of the series Pd, Pt, Au and Ag in an amount of 0.1 to 10% by weight iodine.

Reference to an alloy of palladium has been removed from all of Applicants' presently solicited Claims which in all instances concern technology that is directed to a different chemical reaction.

It is well established law that patentability is negated under 35 U.S.C. § 102 only when the prior disclosure is identical to the invention sought to be patented. Each and every element of the claimed invention must be disclosed in a single reference in complete details. See Akzo N.V. v. United States ITC, 808 F. 2d 1471, 1 USPQ 2d 1241 (Fed. Cir. 1986); Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 806 F. 2d 1565, 1 USPQ 2d 1081 (Fed. Cir. 1986); Rolls-Royce Ltd. v. GTE Valeron Corp., 800 F. 2d 1101, 231 USPQ 185 (Fed. Cir. 1986); Kloster Speedsteel AB v. Crucible Inc. 793 F. 2d 1565, 230 USPQ 81 (Fed. Cir. 1986). The withdrawal of the rejection is urged to be in order and is respectfully requested.

If there is any remaining point that requires clarification prior to the allowance of the Application, the Examiner is urged to telephone the undersigned attorney so that the matter can be discussed and promptly resolved.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: November 15, 2007

By: Benton S. Duffett Jr.

Benton S. Duffett, Jr.  
Registration No. 22030

P.O. Box 1404  
Alexandria, Virginia 22313-1404  
(703) 836-6620